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Composition containing an opacifier or pearlescent agent  
and at least two fatty alcohols

5 The present invention relates to a composition  
comprising at least one saturated linear fatty alcohol with  
a long chain containing 22 carbon atoms, at least one  
saturated linear fatty alcohol with a long chain containing  
18 carbon atoms and at least one opacifier and/or  
pearlescent agent, to a composition comprising at least one  
10 surfactant base, at least one saturated linear fatty  
alcohol with a long chain containing 22 carbon atoms, at  
least one saturated linear fatty alcohol with a long chain  
containing 18 carbon atoms and at least one opacifier  
and/or pearlescent agent, to their use as pearlescent  
15 agent, to a cosmetic composition comprising, in a  
cosmetically acceptable medium, at least one surfactant  
base, at least one saturated linear fatty alcohol with a  
long chain containing 22 carbon atoms, at least one  
saturated linear fatty alcohol with a long chain containing  
20 18 carbon atoms, at least one opacifier and/or pearlescent  
agent and at least one agent for conditioning keratin  
materials. The invention also relates to the use of said  
composition as a suspension agent for insoluble  
conditioners.

25 It is well known that hair which has been  
sensitized (i.e. damaged and/or embrittled) to varying

degrees under the action of atmospheric agents or under the action of mechanical or chemical treatments, such as dyeing, bleaching and/or permanent-waving operations, is often difficult to disentangle and to style, and lacks softness.

It has already been recommended to use conditioners, in particular insoluble conditioners, in compositions for washing or caring for keratin materials such as the hair, in order to facilitate disentangling of the hair and to make it soft, shiny and supple.

Given the insoluble nature of certain conditioners such as, for example, silicones or oils, it is sought to keep the conditioners uniformly dispersed in the medium without, however, reducing the viscosity or the detergent or foaming properties of the compositions. The silicones should also be delivered onto the treated keratin materials so as to give them, after the application, properties of softness, sheen and disentanglement.

It is also known that products, in particular cosmetic products, which have an iridescent, shimmering or metallized appearance or effect are widely favored by consumers on account of their esthetic appeal and the fact that they give the product an appearance of richness. The agents which provide this effect are pearling agents generally comprising crystals which remain dispersed in the compositions and which reflect light.

Few means are currently available for effectively keeping insoluble conditioners in suspension, since this is a difficult problem to solve; to this end, it has already been proposed to use long-chain ester derivatives or polysaccharides such as xanthan gum. However, long-chain ester derivatives can present crystallization problems which lead to a change in the viscosity of the compositions over time; gelling agents also have drawbacks, namely, on the one hand, it is difficult to develop a foam with detergent compositions containing xanthan gum (poor foam initiation), and, on the other hand, the compositions do not have a smooth texture and they flow in blobs, which users do not particularly appreciate.

Long-chain ether or thioether derivatives, such as those described in patent applications EP 457 688 and WO 98/03155, are also known. However, these agents opacify the compositions without giving them any or giving them insufficient pearling effect.

Attempts have already been made to improve the pearling effect by adding thickeners and/or other pearlescent agents, but, in this case, the viscosity becomes too high and/or the composition is no longer stable.

The Applicant has discovered, and this forms the subject of the invention, that the use of at least one

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saturated linear fatty alcohol with a long chain containing  
22 carbon atoms and at least one saturated linear fatty  
alcohol with a long chain containing 18 carbon atoms, the  
C18 fatty alcohol/C22 fatty alcohol ratio being greater  
5 than 0.15, makes it possible to give a pearlescent effect  
to, and/or to improve the pearlescent effect of,  
compositions comprising at least one surfactant base and at  
least one opacifier and/or pearlescent agent. Furthermore,  
this combination makes it possible to stabilize the  
10 viscosity as a function of the temperature.

One subject of the invention is thus compositions  
comprising at least one saturated linear fatty alcohol with  
a long chain containing 22 carbon atoms, at least one  
saturated linear fatty alcohol with a long chain containing  
15 18 carbon atoms and at least one opacifier and/or  
pearlescent agent.

A subject of the invention is also compositions  
especially comprising at least one surfactant base, at  
least one saturated linear fatty alcohol with a long chain  
20 containing 22 carbon atoms, at least one saturated linear  
fatty alcohol with a long chain containing 18 carbon atoms  
and at least one opacifier and/or pearlescent agent, the  
C18 fatty alcohol/C22 fatty alcohol ratio being greater  
than 0.15.

25 The compositions according to the invention may  
be used as pearlescent bases for cosmetic compositions to

afford a pearlescent effect which is superior to that obtained with the opacifier and/or pearlescent agent.

A subject of the invention is also the use of at least one saturated linear fatty alcohol with a long chain containing 22 carbon atoms, at least one saturated linear fatty alcohol with a long chain containing 18 carbon atoms, the C18 fatty alcohol/C22 fatty alcohol ratio being greater than 0.15, and of an opacifier, as a novel pearlescent agent.

The compositions show very good homogeneity and good stability of the pearlescent effect, along with a viscosity which is satisfactory for use on keratin materials.

Other subjects of the invention will become apparent on reading the description and the examples which follow.

The fatty alcohol containing 22 carbon atoms is especially sold in the form of a mixture of fatty alcohols. More particularly, the mixture comprises at least 70% by weight of C22 alcohol relative to the total weight of the mixture of fatty alcohols.

Such mixtures of fatty alcohols are, especially, the products sold under the name Nafol 1822 C by the company Condea, which contains about 74-78% of C22, or the product sold under the name Nafol 2298 by the company Condea, which contains about 98% of C22 alcohol.

According to the invention, the saturated linear fatty alcohol containing 22 carbon atoms may represent from 0.5% to 10% by weight, preferably from 0.5% to 5% by weight and even more preferentially from 0.5% to 3% by weight, relative to the total weight of the final composition.

According to the invention, the saturated linear fatty alcohol containing 18 carbon atoms may represent from 0.3% to 10% by weight, preferably from 0.5% to 5% by weight and even more preferentially from 0.5% to 3% by weight, relative to the total weight of the final composition.

The C18 fatty alcohol/C22 fatty alcohol ratio greater than 0.15 is generally between 0.2 and 20, especially between 0.25 and 10 and preferably between 0.3 and 5.

The pearlescent agents and/or opacifiers which can be used according to the invention can be chosen from:  
A) fatty dialkyl ethers which are solid at a temperature of less than or equal to about 30°C, such as, for example, the dialkyl ethers of formula (I):



in which:

R and R', which may be identical or different, denote a saturated or unsaturated, linear or branched alkyl radical comprising from 12 to 30 carbon atoms and preferably from 14 to 24 carbon atoms, R and R' being chosen such that the compound of formula (I) is solid at a temperature of less

than or equal to about 30°C. More particularly, R and R' are identical.

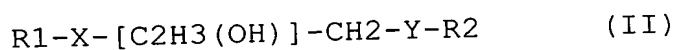
Preferably, R and R' denote a stearyl radical.

The dialkyl ethers which can be used in the compositions according to the invention are water-insoluble, that is to say that they are insoluble in water at a concentration of greater than or equal to 0.1% by weight in water at 25°C.

These compounds can be prepared according to the process described in patent application DE 4 127 230.

A distearyl ether which can be used in the context of the present invention is sold in particular under the name Cutina STE by the company Henkel.

B) alcohols containing from 27 to 48 carbon atoms and comprising one or two ether and/or thioether or sulfoxide groups corresponding to formula (II):



in which

R1 and R2 denote, independently of each other, linear C12 to C24 alkyl groups;

X denotes an oxygen atom, a sulfur atom or a sulfoxide or methylene group;

Y denotes an oxygen atom, a sulfur atom or a sulfoxide or methylene group;

when Y denotes a methylene group, the sum of the number of carbon atoms present in the groups R1 and R2 has a value

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ranging from 24 to 44 and preferably from 28 to 40

inclusive;

when Y does not denote a methylene group, the sum of the carbon atoms present in the groups R1 and R2 has a value

5 ranging from 24 to 44 and preferably from 28 to 40

inclusive;

when X or Y denotes sulfoxide, Y or X does not denote sulfur.

10 The compounds of formula (II) preferably used in accordance with the invention are those for which X denotes oxygen, Y denotes methylene and R1 and R2 denote radicals containing 12 to 22 carbon atoms.

These compounds can be prepared according to patent EP 457 688.

15 C) acyl derivatives comprising at least one fatty chain containing from 8 to 30 carbon atoms. The expression "acyl derivative" means compounds comprising at least one group  $RC(=O)-$ , R denoting a fatty chain containing from 8 to 30 carbon atoms.

20 Among these compounds, mention may especially be made of ethylene glycol monostearate and ethylene glycol distearate.

According to the invention, the pearlescent agent and/or opacifier may represent from 0.5% to 15% by weight  
25 and preferably from 1% to 5% by weight, relative to the total weight of the final composition.

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The compositions of the invention also contain at least one surfactant base which is generally present in an amount of between 1% and 60% by weight approximately, preferably between 3% and 40% and even more preferentially between 5% and 30%, relative to the total weight of the composition.

The surfactant base consists of surfactants which may be chosen from anionic, amphoteric, nonionic and cationic surfactants, or mixtures thereof.

The surfactants which are suitable for carrying out the present invention are, in particular, the following:

(i) Anionic surfactant(s):

In the context of the present invention, their nature is not really a critical feature.

Thus, by way of example of anionic surfactants which can be used, alone or as mixtures, in the context of the present invention, mention may be made in particular (nonlimiting list) of salts (in particular alkali metal salts, especially sodium salts, ammonium salts, amine salts, amino alcohol salts or magnesium salts) of the following compounds: alkyl sulfates, alkyl ether sulfates, alkylamido ether sulfates, alkylaryl polyether sulfates, monoglyceride sulfates; alkyl sulfonates, alkyl phosphates, alkylamide sulfonates, alkylaryl sulfonates,  $\alpha$ -olefin sulfonates, paraffin sulfonates; alkyl sulfosuccinates,

alkyl ether sulfosuccinates, alkylamide sulfosuccinates; alkyl sulfosuccinamates; alkyl sulfoacetates; alkyl ether phosphates; acyl sarcosinates; acyl isethionates and N-acyl taurates, the alkyl or acyl radical of all of these different compounds preferably containing from 8 to 24 carbon atoms and the aryl radical preferably denoting a phenyl or benzyl group. Among the anionic surfactants which can also be used, mention may also be made of fatty acid salts such as oleic, ricinoleic, palmitic and stearic acid salts, coconut oil acid or hydrogenated coconut oil acid; acyl lactylates in which the acyl radical contains 8 to 20 carbon atoms. It is also possible to use weakly anionic surfactants, such as alkyl D-galactoside uronic acids and their salts, as well as polyoxyalkylenated (C<sub>6</sub>-C<sub>24</sub>)alkyl ether carboxylic acids, polyoxyalkylenated (C<sub>6</sub>-C<sub>24</sub>)alkylaryl ether carboxylic acids, polyoxyalkylenated (C<sub>6</sub>-C<sub>24</sub>)alkylamido ether carboxylic acids and their salts, in particular those containing from 2 to 50 ethylene oxide groups, and mixtures thereof.

Among the anionic surfactants preferably used according to the invention are alkyl sulfate and alkyl ether sulfate salts, and mixtures thereof.

(ii) Nonionic surfactant(s):

The nonionic surfactants are, themselves also, compounds that are well known per se (see in particular in this respect "Handbook of Surfactants" by M.R. Porter,

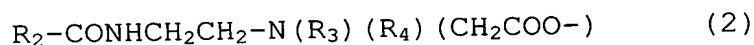
published by Blackie & Son (Glasgow and London), 1991, pp. 116-178) and, in the context of the present invention, their nature is not a critical feature. Thus, they can be chosen in particular from (nonlimiting list)

5 polyethoxylated, polypropoxylated or polyglycerolated fatty acids, alkylphenols, alpha-diols or alcohols having a fatty chain containing, for example, 8 to 18 carbon atoms, it being possible for the number of ethylene oxide or propylene oxide groups to range in particular from 2 to 50  
10 and for the number of glycerol groups to range in particular from 2 to 30. Mention may also be made of copolymers of ethylene oxide and of propylene oxide, condensates of ethylene oxide and of propylene oxide with fatty alcohols; polyethoxylated fatty amides preferably  
15 having from 2 to 30 mol of ethylene oxide, polyglycerolated fatty amides containing 1 to 5, and in particular 1.5 to 4, glycerol groups; polyethoxylated fatty amines preferably having 2 to 30 mol of ethylene oxide; oxyethylenated fatty acid esters of sorbitan having from 2 to 30 mol of ethylene  
20 oxide; fatty acid esters of sucrose, fatty acid esters of polyethylene glycol, alkylpolyglycosides, N-alkylglucamine derivatives, and amine oxides such as (C<sub>10</sub>-C<sub>14</sub>)alkylamine oxides or N-acylaminopropylmorpholine oxides. It will be noted that the alkylpolyglycosides constitute nonionic  
25 surfactants that are particularly suitable in the context of the present invention.

(iii) Amphoteric or zwitterionic surfactant(s):

The amphoteric or zwitterionic surfactants, whose nature is not a critical feature in the context of the present invention, can be, in particular (nonlimiting list), aliphatic secondary or tertiary amine derivatives in which the aliphatic radical is a linear or branched chain containing 8 to 18 carbon atoms and containing at least one water-solubilizing anionic group (for example carboxylate, sulfonate, sulfate, phosphate or phosphonate); mention may also be made of (C<sub>8</sub>-C<sub>20</sub>)alkylbetaines, sulfobetaines, (C<sub>8</sub>-C<sub>20</sub>)alkylamido(C<sub>1</sub>-C<sub>6</sub>)alkylbetaines or (C<sub>8</sub>-C<sub>20</sub>)alkylamido(C<sub>1</sub>-C<sub>6</sub>)alkylsulfobetaines.

Among the amine derivatives, mention may be made of the products sold under the name Miranol, as described in US patents 2 528 378 and 2 781 354 and classified in the CTFA dictionary, 3rd edition, 1982, under the names Amphocarboxyglycinates and Amphocarboxypropionates, with the respective structures:



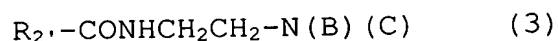
in which:

R<sub>2</sub> denotes an alkyl radical of an acid R<sub>2</sub>-COOH present in hydrolyzed coconut oil, a heptyl, nonyl or undecyl radical,

R<sub>3</sub> denotes a beta-hydroxyethyl group and

R<sub>4</sub> denotes a carboxymethyl group;

and



in which:

B represents  $-\text{CH}_2\text{CH}_2\text{OX}'$ , C represents  $-(\text{CH}_2)_z-\text{Y}'$ , with  $z = 1$  or 2,

X' denotes the  $-\text{CH}_2\text{CH}_2-\text{COOH}$  group or a hydrogen atom,

5 Y' denotes  $-\text{COOH}$  or the  $-\text{CH}_2-\text{CHOH}-\text{SO}_3\text{H}$  radical,

R<sub>2</sub>' denotes an alkyl radical of an acid R<sub>3</sub>-COOH present in coconut oil or in hydrolyzed linseed oil, an alkyl radical, in particular a C<sub>7</sub>, C<sub>9</sub>, C<sub>11</sub> or C<sub>13</sub> alkyl radical, a C<sub>17</sub> alkyl radical and its iso form, or an unsaturated C<sub>17</sub> radical.

10 By way of example, mention may be made of the cocoamphocarboxyglycinate sold under the trade name Miranol C2M concentrate by the company Rhodia Chimie.

(iv) Cationic surfactants:

15 Among the cationic surfactants, whose nature, in the context of the present invention, is not a critical feature, mention may be made in particular (nonlimiting list) of: salts of optionally polyoxyalkylenated primary, secondary or tertiary fatty amines; quaternary ammonium salts such as tetraalkylammonium,

20 alkylamidoalkyltrialkylammonium, trialkylbenzylammonium, trialkylhydroxyalkylammonium or alkylpyridinium chlorides or bromides; imidazoline derivatives; or amine oxides of cationic nature.

25 According to one preferred variant of the invention, the cosmetic compositions may also contain agents for conditioning keratin materials.

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A subject of the invention is thus also novel cosmetic compositions, in particular foaming conditioning and washing compositions, comprising, in a cosmetically acceptable medium, a surfactant base, at least one conditioner, at least one saturated linear fatty alcohol with a long chain containing 22 carbon atoms, at least one saturated linear fatty alcohol with a long chain containing 18 carbon atoms and at least one opacifier and/or pearlescent agent.

The compositions thus prepared also have good detergent and foaming properties and impart great softness to keratin materials, especially the hair and/or the skin.

When these compositions are applied to the hair, in addition to their washing properties, they have hair-conditioning properties, that is to say that the treated hair is smooth, disentangles easily and feels soft. The hair has a natural look and does not look lank.

The compositions according to the invention containing conditioners are stable: in particular, no release of the conditioners or uncontrolled thickening of the composition over time takes place. Finally, the compositions have a non-runny and fondant texture. The foam rinses out easily.

Another subject of the invention consists of the washing and conditioning process using such compositions.

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A subject of the invention is also the use of at least one saturated linear fatty alcohol with a long chain containing 22 carbon atoms, of at least one saturated linear fatty alcohol with a long chain containing 18 carbon atoms and of at least one opacifier and/or pearlescent agent, as a suspension agent for a conditioner which is insoluble in a cosmetic composition, in particular a foaming conditioning and washing composition containing, in a cosmetically acceptable aqueous medium, a surfactant base.

When the composition contains at least one conditioner, they are generally chosen from synthetic oils such as poly- $\alpha$ -olefins, fluoro oils, fluoro waxes, fluoro gums, carboxylic acid esters, cationic polymers, silicones, mineral, plant or animal oils, ceramides and pseudoceramides, and mixtures thereof.

The polyolefins are preferably poly- $\alpha$ -olefins and in particular:

- of hydrogenated or non-hydrogenated polybutene type, and preferably hydrogenated or non-hydrogenated polyisobutene.

Isobutylene oligomers with a molecular weight of less than 1 000 and mixtures thereof with polyisobutylenes with a molecular weight of greater than 1000 and preferably of between 1 000 and 15 000 are preferably used.



As examples of poly- $\alpha$ -olefins which can be used in the context of the present invention, mention may be made more particularly of the polyisobutenes sold under the name Permethyl 99 A, 101 A, 102 A, 104 A (n=16) and 106 A (n=38) by the company Presperse Inc., or alternatively the products sold under the name Arlamol HD (n=3) by the company ICI (n denoting the degree of polymerization).

- of hydrogenated or non-hydrogenated polydecene type.

Such products are sold, for example, under the names Ethylflo by the company Ethyl Corp. and Arlamol PAO by the company ICI.

The mineral oils which may be used in the compositions of the invention are preferentially chosen from the group formed by:

- hydrocarbons, such as hexadecane and liquid petroleum jelly;

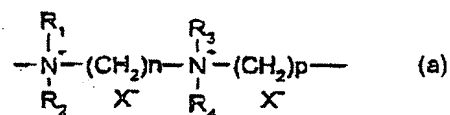
The cationic polymers which may be used in accordance with the present invention may be chosen from any of those already known per se as improving the cosmetic properties of hair treated with detergent compositions, that is to say especially those described in patent application EP-A-0 337 354 and in French patent applications FR-A-2 270 846, 2 383 660, 2 598 611, 2 470 596 and 2 519 863.

Even more generally, for the purposes of the present invention, the expression "cationic polymer" denotes any polymer containing cationic groups and/or groups which may be ionized into cationic groups.

5           Among all the cationic polymers which can be used in the context of the present invention, it is preferred to use quaternary cellulose ether derivatives such as the products sold under the name "JR400" by the company Union Carbide Corporation, cyclopolymers, in particular  
10 homopolymers of a diallyldimethylammonium salt and copolymers of a diallyldimethylammonium salt and of acrylamide, in particular the chlorides, sold under the names "Merquat 100", "Merquat 550" and "Merquat S" by the company Merck, cationic polysaccharides and more  
15 particularly guar gums modified with 2,3-epoxypropyltrimethylammonium chloride, sold, for example, under the name "Jaguar C13S" by the company Meyhall, optionally crosslinked homopolymers and copolymers of a (meth)acryloyloxyethyltrimethylammonium salt, sold by  
20 the company Allied Colloids as a 50% solution in mineral oil, under the trade names Salcare SC92 (crosslinked copolymer of methacryloyloxyethyltrimethylammonium chloride and of acrylamide) and Salcare SC95 (crosslinked homopolymer of methacryloyloxyethyltrimethylammonium  
25 chloride).

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It is also possible to use the polymers which consist of repeating units corresponding to the formula:



in which R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>, which may be identical or different, denote an alkyl or hydroxyalkyl radical containing from 1 to 4 carbon atoms approximately, n and p are integers ranging from 2 to 20 approximately and X<sup>-</sup> is an anion derived from an inorganic or organic acid.

The silicones which may be used in accordance with the invention are, in particular, polyorganosiloxanes which are insoluble in the composition and may be in the form of oils, waxes, resins or gums.

The water-insoluble silicones are insoluble in water at a concentration of greater than or equal to 0.1% by weight in water at 25°C, that is to say that they do not form a transparent isotropic solution.

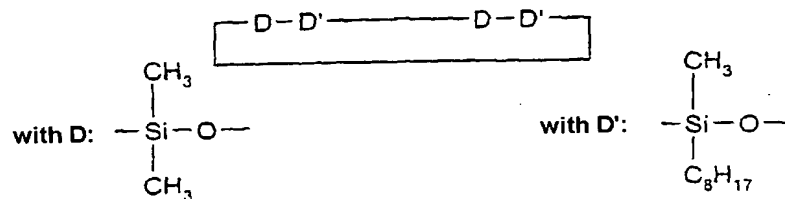
The viscosity of the silicones is measured, for example, at 25°C according to ASTM standard 445 Appendix C.

The organopolysiloxanes are defined in greater detail in Walter Noll's "Chemistry and Technology of Silicones" (1968) Academic Press. They can be volatile or nonvolatile.

When they are volatile, the silicones are more particularly chosen from those having a boiling point of between 60°C and 260°C, and even more particularly from:

(i) cyclic silicones containing from 3 to 7 and preferably 4 to 5 silicon atoms. These are, for example, octamethylcyclotetrasiloxane sold in particular under the name "Volatile Silicone 7207" by Union Carbide or "Silbione 70045 V 2" by Rhodia Chimie, decamethylcyclopentasiloxane sold under the name "Volatile Silicone 7158" by Union Carbide, and "Silbione 70045 V 5" by Rhodia Chimie, and mixtures thereof.

Mention may also be made of cyclocopolymers of the dimethylsiloxanes/methylalkylsiloxane type, such as "Volatile Silicone FZ 3109" sold by the company Union Carbide, with the chemical structure:



Mention may also be made of mixtures of cyclic silicones with organosilicon compounds, such as the mixture of octamethylcyclotetrasiloxane and tetratrimethylsilylpentaerythritol (50/50) and the mixture of octamethylcyclotetrasiloxane and oxy-1,1'-bis(2,2,2',2',3,3'-hexatrimethylsilyloxy)neopentane;

(ii) linear volatile silicones containing 2 to 9 silicon atoms and having a viscosity of less than or equal to  $5 \times 10^{-6} \text{ m}^2/\text{s}$  at  $25^\circ\text{C}$ . An example is decamethyltetrasiloxane sold in particular under the name "SH 200" by the company

Toray Silicone. Silicones belonging to this category are also described in the article published in Cosmetics and Toiletries, Vol. 91, Jan. 76, pp. 27-32, Todd & Byers "Volatile Silicone Fluids for Cosmetics".

5 Nonvolatile silicones, and more particularly polyalkylsiloxanes, polyarylsiloxanes, polyalkylarylsiloxanes, silicone gums and resins, polyorganosiloxanes modified with organofunctional groups, and mixtures thereof, are preferably used.

10 These silicones are more particularly chosen from polyalkylsiloxanes, among which mention may be made mainly of polydimethylsiloxanes containing trimethylsilyl end groups having a viscosity of from  $5 \times 10^{-6}$  to  $2.5 \text{ m}^2/\text{s}$  at  $25^\circ\text{C}$  and preferably  $1 \times 10^{-5}$  to  $1 \text{ m}^2/\text{s}$ .

15 Among these polyalkylsiloxanes, mention may be made, in a nonlimiting manner, of the following commercial products:

- the oils of the Mirasil series sold by the company Rhodia Chimie, such as, for example, the oil Mirasil DM 500 000;
- 20 - the oils of the 200 series from the company Dow Corning, such as, more particularly, DC200 with a viscosity of 60 000 cSt;
- the Viscasil oils from General Electric and certain oils of the SF series (SF 96, SF 18) from General Electric.

25 Mention may also be made of polydimethylsiloxanes containing dimethylsilanol end groups (Dimethiconol

according to the CTFA name) such as the oils of the 48 series from the company Rhodia Chimie.

In this category of polyalkylsiloxanes, mention may also be made of the products sold under the names "Abil  
5 Wax 9800 and 9801" by the company Goldschmidt, which are poly(C<sub>1</sub>-C<sub>20</sub>)alkylsiloxanes.

The polyalkylarylsiloxanes are chosen particularly from linear and/or branched polydimethylmethylphenylsiloxanes and  
10 polydimethyldiphenylsiloxanes with a viscosity of from  $1 \times 10^{-5}$  to  $5 \times 10^{-2}$  m<sup>2</sup>/s at 25°C.

Among these polyalkylarylsiloxanes, mention may be made, by way of example, of the products sold under the following names:

- 15 . the oils Mirasil DPDM from Rhodia Chimie;
- . the oils of the Rhodorsil 70 633 and 763 series from Rhodia Chimie;
- . the oil Dow Corning 556 Cosmetic Grade Fluid from Dow Corning;
- 20 . the silicones of the PK series from Bayer, such as the product PK20;
- . the silicones of the PN and PH series from Bayer, such as the products PN1000 and PH1000;
- . certain oils of the SF series from General Electric,  
25 such as SF 1023, SF 1154, SF 1250 and SF 1265.

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The silicone gums which can be used in accordance with the invention are, in particular, polydiorgano-siloxanes having high number-average molecular masses of between 200 000 and 1 000 000, used alone or as a mixture in a solvent. This solvent can be chosen from volatile silicones, polydimethylsiloxane (PDMS) oils, polyphenylmethylsiloxane (PPMS) oils, isoparaffins, polyisobutylenes, methylene chloride, pentane, dodecane and tridecanes, or mixtures thereof.

Mention may be made more particularly of the following products:

- polydimethylsiloxane
- polydimethylsiloxane/methylvinylsiloxane gums,
- polydimethylsiloxane/diphenylsiloxane,
- polydimethylsiloxane/phenylmethylsiloxane,
- polydimethylsiloxane/diphenylsiloxane/methylvinylsiloxane.

Products which can be used more particularly in accordance with the invention are mixtures such as:

- mixtures formed from a polydimethylsiloxane hydroxylated at the end of the chain (referred to as dimethiconol according to the nomenclature in the CTFA dictionary) and from a cyclic polydimethylsiloxane (referred to as cyclomethicone according to the nomenclature in the CTFA dictionary), such as the product Q2 1401 sold by the company Dow Corning;

· mixtures formed from a polydimethylsiloxane gum with a cyclic silicone, such as the product SF 1214 Silicone Fluid from the company General Electric; this product is an SF 30 gum corresponding to a dimethicone, having a number-average molecular weight of 500 000, dissolved in the oil SF 1202 Silicone Fluid corresponding to decamethylcyclopentasiloxane;

· mixtures of two PDMSs of different viscosities, and more particularly of a PDMS gum and a PDMS oil, such as the product SF 1236 from the company General Electric. The product SF 1236 is a mixture of an SE 30 gum defined above, having a viscosity of 20 m<sup>2</sup>/s, and an SF 96 oil, with a viscosity of 5×10<sup>-6</sup> m<sup>2</sup>/s. This product preferably contains 15% SE 30 gum and 85% SF 96 oil.

The organopolysiloxane resins which can be used in accordance with the invention are crosslinked siloxane systems containing the following units:

$R_2SiO_{2/2}$ ,  $R_3SiO_{1/2}$ ,  $RSiO_{3/2}$  and  $SiO_{4/2}$  in which R represents a hydrocarbon-based group containing 1 to 16 carbon atoms or a phenyl group. Among these products, those particularly preferred are the ones in which R denotes a C<sub>1</sub>-C<sub>4</sub> lower alkyl radical, more particularly methyl, or a phenyl radical.

Among these resins, mention may be made of the product sold under the name "Dow Corning 593" or those sold under the names "Silicone Fluid SS 4230 and SS 4267" by the



company General Electric, which are silicones of dimethyl/trimethyl siloxane structure.

Mention may also be made of the trimethyl siloxysilicate type resins sold in particular under the names X22-4914, X21-5034 and X21-5037 by the company Shin-Etsu.

The organomodified silicones which can be used in accordance with the invention are silicones as defined above and containing in their structure one or more organofunctional groups attached via a hydrocarbon-based radical.

Among the organomodified silicones, mention may be made of polyorganosiloxanes containing:

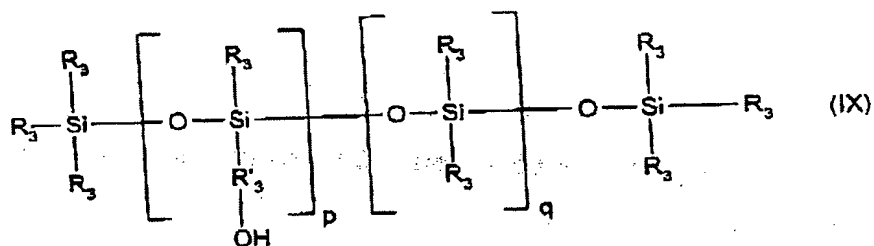
- polyethylenoxy and/or polypropylenoxy groups optionally containing C<sub>6</sub>-C<sub>24</sub> alkyl groups, such as the products known as dimethicone copolyol sold by the company Dow Corning under the name DC 1248 or the oils Silwet L 722, L 7500, L 77 and L 711 from the company Union Carbide and the (C<sub>12</sub>)alkylmethicone copolyol sold by the company Dow Corning under the name Q2 5200;

- substituted or unsubstituted amine groups, such as the products sold under the name GP 4 Silicone Fluid and GP 7100 by the company Genesee, or the products sold under the names Q2 8220 and Dow Corning 929 or 939 by the company Dow Corning. The substituted amine groups are, in particular, C<sub>1</sub>-C<sub>4</sub> aminoalkyl groups;

- thiol groups such as the products sold under the names "GP 72 A" and "GP 71" from Genesee;

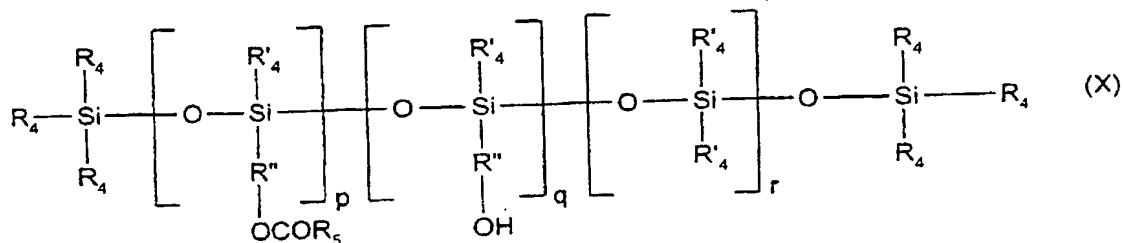
- alkoxyated groups such as the product sold under the name "Silicone Copolymer F-755" by SWS Silicones and Abil Wax 2428, 2434 and 2440 by the company Goldschmidt;

- hydroxylated groups such as the polyorganosiloxanes containing a hydroxyalkyl function, described in French patent application FR-A-85/16334 corresponding to formula (IX):



in which the radicals  $R_3$ , which may be identical or different, are chosen from methyl and phenyl radicals; at least 60 mol% of the radicals  $R_3$  denoting methyl; the radical  $R'_3$  is a divalent  $C_2-C_{18}$  hydrocarbon-based alkylene chain unit;  $p$  is between 1 and 30 inclusive;  $q$  is between 1 and 150 inclusive;

- acyloxyalkyl groups such as, for example, the polyorganosiloxanes described in patent US-A-4 957 732 and corresponding to formula (X):



in which:

$R_4$  denotes a methyl, phenyl,  $-OCOR_5$  or hydroxyl group, only one of which radicals  $R_4$  per silicon atom may be OH;

5  $R_4'$  denotes methyl or phenyl; at least 60 mol% of all of the radicals  $R_4$  and  $R_4'$  denoting methyl;

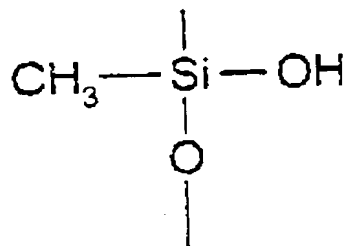
$R_5$  denotes  $C_8$ - $C_{20}$  alkyl or alkenyl;

$R''$  denotes a linear or branched, divalent  $C_2$ - $C_{18}$  hydrocarbon-based alkylene radical;

10  $r$  is between 1 and 120 inclusive;

$p$  is between 1 and 30;

$q$  is equal to 0 or is less than 0.5  $p$ ,  $p + q$  being between 1 and 30; the polyorganosiloxanes of formula (VI) can contain groups:



in proportions not exceeding 15% of the sum  $p + q + r$ .

- anionic groups of carboxylic type, such as, for example, in the products described in patent EP 186 507 from the company Chisso Corporation, or of alkylcarboxylic type, such as those present in the product X-22-3701E from the company Shin-Etsu; 2-hydroxyalkyl sulfonate; 2-hydroxyalkyl thiosulfate such as the products sold by the company Goldschmidt under the names "Abil S201" and "Abil S255".

- hydroxyacylamino groups, such as the polyorganosiloxanes described in patent application EP 342 834. Mention may be made, for example, of the product Q2-8413 from the company Dow Corning.

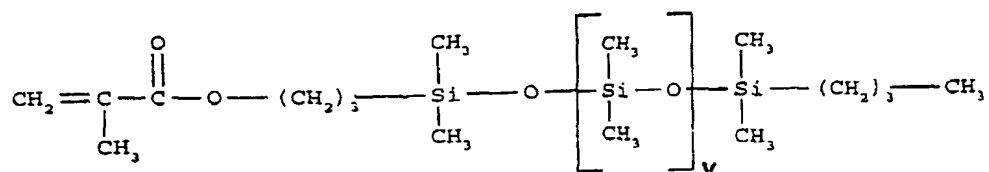
According to the invention, silicones can also be used comprising a polysiloxane portion and a portion consisting of a non-silicone organic chain, one of the two portions constituting the main chain of the polymer, the other being grafted onto said main chain. These polymers are described, for example, in patent applications EP-A-412 704, EP-A-412 707, EP-A-640 105, WO 95/00578, EP-A-582 152 and WO 93/23009 and US patents 4 693 935, 4 728 571 and 4 972 037. These polymers are preferably anionic or nonionic.

Such polymers are, for example, copolymers which can be obtained by radical polymerization starting with a monomer mixture consisting of:

a) 50 to 90% by weight of tert-butyl acrylate;

b) 0 to 40% by weight of acrylic acid;

c) 5 to 40% by weight of silicone macromer of formula:



with v being a number ranging from 5 to 700; the weight percentages being calculated relative to the total weight of the monomers.

Other examples of grafted silicone polymers are, in particular, polydimethylsiloxanes (PDMS) onto which are grafted, via a connecting chain unit of thiopropylene type, mixed polymer units of poly(meth)acrylic acid type and of polyalkyl (meth)acrylate type and polydimethylsiloxanes (PDMS) onto which are grafted, via a connecting chain unit of thiopropylene type, polymer units of polyisobutyl (meth)acrylate type.

According to the invention, all of the silicones can also be used in the form of emulsions.

The polyorganosiloxanes which are particularly preferred in accordance with the invention are:

- nonvolatile silicones chosen from the family of

polyalkylsiloxanes containing trimethylsilyl end groups, such as oils having a viscosity of between 0.2 and 2.5 m<sup>2</sup>/s at 25°C, such as the oils of the DC200 series from Dow Corning, in particular that with a viscosity of 60 000 cSt, of the Mirasil DM series and more particularly the oil

Mirasil DM 500 000, which are sold by the company Rhodia Chimie or the silicone oil AK 300 000 from the company Wacker, polyalkylsiloxanes containing dimethylsilanol end groups, such as dimethiconols, or polyalkylarylsiloxanes such as the oil Mirasil DPDM sold by the company Rhodia Chimie;

- polysiloxanes containing amine groups, such as amodimethicones or trimethylsilylamodimethicones.

According to the present invention, the compounds of ceramide type are in particular natural or synthetic ceramides and/or glycosceramides and/or pseudoceramides and/or neoceramides.

Compounds of ceramide type are described, for example, in patent applications DE 4 424 530, DE 4 424 533, DE 4 402 929, DE 4 420 736, WO 95/23807, WO 94/07844, EP-A-0 646 572, WO 95/16665, FR-2 673 179, EP-A-0 227 994, WO 94/07844, WO 94/24097 and WO 94/10131, the teachings of which are included herein by way of reference.

Compounds of ceramide type that are particularly preferred according to the invention are, for example:

- 2-N-linoleoylaminooctadecane-1,3-diol,
- 2-N-oleoylaminooctadecane-1,3-diol,
- 2-N-palmitoylaminooctadecane-1,3-diol,
- 2-N-stearoylaminooctadecane-1,3-diol,
- 2-N-behenoylaminooctadecane-1,3-diol,

- 2-N-[2-hydroxypalmitoyl]aminooctadecane-1,3-diol,
- 2-N-stearoylaminoctadecane-1,3,4-triol and in particular N-stearoylphytosphingosine,
- 5       - 2-N-palmitoylaminohexadecane-1,3-diol,
- bis(N-hydroxyethyl-N-cetyl)malonamide,
- N-(2-hydroxyethyl)-N-(3-cetyloxy-2-hydroxy-propyl)cetylamine,
- N-docosanoyl-N-methyl-D-glucamine
- 10   or mixtures of these compounds.

According to the invention, the conditioners may represent from 0.001% to 10% by weight, preferably from 0.005% to 5% by weight and even more preferentially from 0.01% to 3% by weight, relative to the total weight of the

15   final composition.

The cosmetically acceptable medium preferably consists of water or a mixture of water and cosmetically or dermatologically acceptable solvents such as monoalcohols, polyalcohols and glycol ethers, which may be used alone or

20   as a mixture.

Mention may be made more particularly of lower alcohols such as ethanol and isopropanol, polyalcohols such as diethylene glycol and glycerol, glycol ethers, and alkyl ethers of glycol or of diethylene glycol.

25       The composition of the invention can also contain at least one additive chosen from sequestering agents,

softeners, foam modifiers, dyes, other pearlescent agents, hydrating agents, antidandruff or antiseborrheic agents, other suspension agents, fatty acids containing linear or branched C<sub>16</sub>-C<sub>40</sub> chains, hydroxy acids, electrolytes, thickeners, fatty acid esters, fragrances, preserving agents, sunscreens, proteins, vitamins and provitamins, polymers and any other additive conventionally used in cosmetics.

These additives are present in the composition according to the invention in proportions which can range from 0 to 40% by weight relative to the total weight of the composition. The precise amount of each additive depends on its nature and is readily determined by a person skilled in the art.

Needless to say, a person skilled in the art will take care to select the optional compound(s) to be added to the composition according to the invention such that the advantageous properties intrinsically associated with the composition in accordance with the invention are not, or are not substantially, adversely affected by the envisaged addition.

The compositions according to the invention may be in the form of a gel, a milk, a cream, a more or less thickened lotion or a mousse.

The compositions in accordance with the invention may be used for treating keratin materials such as the



hair, the skin, the eyelashes, the eyebrows, the nails, the lips or the scalp, and more particularly the hair.

The compositions may also be used for washing and cleansing keratin materials such as the hair and the skin.

5           The compositions according to the invention are generally used as products especially for washing, caring for, conditioning or maintaining the hairstyle or for shaping keratin materials such as the hair.

10           The compositions of the invention may more particularly be in the form of shampoos, rinse-out or leave-in conditioners, compositions for permanent-waving, relaxing, dyeing or bleaching the hair, or alternatively in the form of compositions to be applied before or after dyeing, bleaching, permanent-waving or relaxing the hair or  
15           alternatively between the two steps of a permanent-waving or relaxing operation. Preferably, the compositions are washing and foaming compositions for the hair and/or the skin.

20           In particular, the compositions according to the invention are foaming detergent compositions such as shampoos, shower gels and bubble baths. In this embodiment of the invention, the compositions comprise a washing surfactant base, which is generally aqueous.

25           The surfactant(s) forming the washing base may be chosen, without distinction, alone or as mixtures, from the

anionic, amphoteric, nonionic, zwitterionic and cationic surfactants described above.

The minimum amount of washing base is that which is just sufficient to give the final composition a satisfactory foaming power and/or detergent power.

Thus, according to the invention, the washing base may represent from 4% to 30% by weight, preferably from 6% to 25% by weight and even more preferentially from 8% to 20% by weight, relative to the total weight of the final composition.

The foaming power of the compositions according to the invention, characterized by a foam height, is generally greater than 75 mm and preferably greater than 100 mm, measured according to the modified Ross-Miles method (NF T 73-404/ISO 696).

The modifications to the method are as follows:

The measurement is performed at a temperature of 22°C with osmosed water. The concentration of the solution is 2 g/l. The drop height is 1 m. The amount of composition which is dropped is 200 ml. These 200 ml of composition fall into a measuring cylinder 50 mm in diameter and containing 50 ml of the test composition. The measurement is carried out 5 minutes after stopping the flow of the composition.

A subject of the invention is also a cosmetic process for treating keratin materials such as the hair,

which consists in applying to the hair a composition as defined above, optionally followed by rinsing with water, after an optional standing time.

5 The invention will now be illustrated more fully with the aid of the examples which follow, which cannot be considered as limiting it to the embodiments described. In the text hereinbelow, AM means Active Material.

### EXAMPLE 1

10 Two shampoos, of the compositions below, were prepared:

Composition A is according to the invention and composition B is a comparative composition of the prior art.

	A (invention)	B
- Sodium lauryl ether sulfate oxyethylenated with 2.2 mol of ethylene oxide, as an aqueous solution containing 70% AM	14 g AM	14 g AM
- Imidazoline derivative surfactant (Miranol C2M conc from Rhodia Chimie)	4 g AM	4 g AM
- Dimethicone (Mirasil DM 500 000 from Rhodia Chimie)	2.6 g	2.6 g
- Guar gum modified with 2,3- epoxypropyltrimethylammonium chloride (Jaguar C13 S from Rhodia Chimie)	0.2 g	0.2 g

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- Mixture of stearyl alcohol (10%) and of distearyl ether (90%)	4 g	4 g
- C18 fatty alcohol (98%)	0.25 g	1 g
- C22 fatty alcohol (76%) (Nafol 1822 C from Condea)	0.75 g AM	-
- Sodium cetostearyl (50/50) sulfate	0.75 g	0.75 g
- Stearyl alcohol oxyethylenated with 10 mol of ethylene oxide (Brij 76 from ICI)	0.8 g	0.8 g
- Preserving agents, fragrance	qs	qs
- Citric acid, 1 H <sub>2</sub> O qs	pH 5	pH 5
- Demineralized water qs	100 g	100 g

The viscosity of the compositions is measured using a VT 550 Viscotester sold by Rheo (MV din B spindle) at a shear rate of 10 s<sup>-1</sup> and a temperature of 25°C.

5 The results are given in the attached Figure 1.

The viscosity of composition A according to the invention is less dependent on the temperature than that of composition B of the prior art (WO 98/03155), these two shampoos having a comparable viscosity at room temperature (25°C).

10

Furthermore, the composition according to the invention has a greater white pearlescent effect than that of composition B.

EXAMPLES 2 and 3

	Ex. 2	Ex. 3
Sodium lauryl ether sulfate (70/30 C12/C14) containing 2.2 mol of ethylene oxide	14.0 g AM	14.0 g AM
Cocoylbetaine as an aqueous solution containing 30% AM	2.4 g AM	
Cocoylamidopropylbetaine as an aqueous solution containing 38% AM		2.7 g AM
Hydroxyethylcellulose crosslinked with epichlorohydrin and quaternized with trimethylamine, sold under the name JR 400 by the company Union Carbide	0.3 g	0.3 g
Polydimethylsiloxane sold under the name Mirasil DM 500 000 by Rhodia Chimie	2.0 g	2.5 g
Glycol distearate	2.0 g	
1-(Hexadecyloxy)-2-octadecanol/cetyl alcohol mixture		2.2 g
Cetylstearyl alcohol containing 98% stearyl alcohol	0.5 g	0.4 g
Mixture of fatty alcohols containing 76% behenyl alcohol, sold under the name Nafol 1822 C by the company Condea	0.5 g	0.6 g
Coconut acid monoisopropylamide	0.7 g	0.7 g
Citric acid                      qs      pH	5.5	5.5

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Fragrance, preserving agents	Qs	qs
Demineralized water qs	100.0 g	100.0 g

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